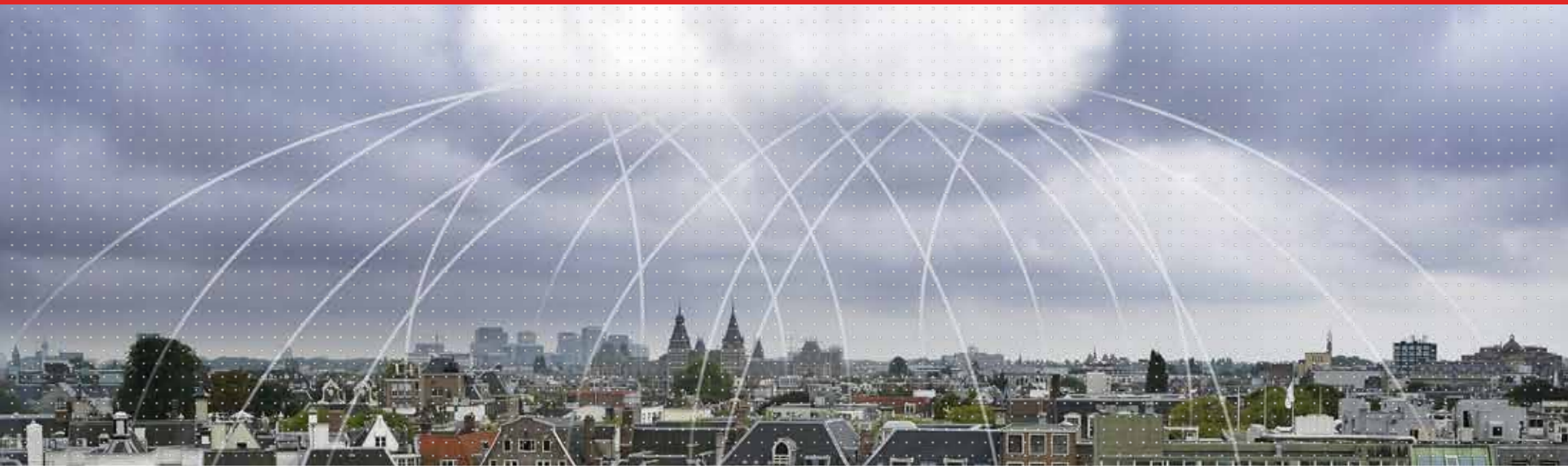
WSJ. CUSTOM STUDIOS

GAINING THE DIGITAL ADVANTAGE

IN COLLABORATION WITH ORACLE



DATA MASTERY: THE GLOBAL DRIVER OF REVENUE

Businesses around the world are trying to figure out how to turn data into capital

The big data race is on, with leading companies beginning to outlap those slower from the start.

In today's economy, data is now a kind of capital, on par with financial capital, for creating new products, services and ways of working. However, 98 percent of executives believe that their company is losing revenue as a result of not effectively managing and leveraging information.

That is one of several striking conclusions from a global survey conducted by Oracle in collaboration with WSJ. Custom Studios. The survey of 742 executives in large enterprises from a wide range of industries — telecommunications, manufacturing, health care, utilities, financial services/insurance and retail — paints a compelling portrait of the opportunities big data presents. It also identifies the journey companies are taking to benefit from missed opportunities around the world.

According to the survey, nine out of 10 executives consider the ability to garner insight from data vital to their company's future. Yet more than half have serious doubts about their organization's ability to manage significant data inflows. Keenly aware of the need to use data more effectively, executives in every field acknowledge the need to build out their technology infrastructure, analytics capabilities, industry-specific applications and staffing to meet growing data demands.

They also know the big data race is on, with leading companies beginning to outlap those slower from the start.

DATA RESHAPING INDUSTRIES

Most executives struggle to make sense of the data affecting their bottom line, estimating an average 16 percent loss in revenue annually. Close to one-fifth of those surveyed estimate their revenue loss at more than 20 percent.

LACK OF DATA MASTERY IS COSTLY

Industry	Potential Revenue Loss (average)
Retail	18%
Manufacturing	16%
Financial Services/Insurance	17%
Telecommunications	15%
Utilities	13%
Health Care	13%

Leaders across industries agree that their financial future hinges on using data better, and more imaginatively, in virtually every aspect of their business. Companies realize the new data landscape isn't simply about fueling their traditional sales reports with new sources of information. They are turning to more sophisticated analytics that can uncover patterns in data or automate decisions, potentially reshaping business processes, companies or even whole industries.

Consider the German telecom that named big data as one of its top priorities for increasing digitization in Europe. Or the online retailers that use machine learning (algorithms which continually learn from data) to make personalized recommendations, providing customers with welcomed offers for goods and services they didn't even know they wanted. There's even a car-sharing service that analyzes weather patterns to forecast where their vehicles will be needed. The company crunches data to determine if vehicles in a certain area will be underutilized — and then lowers the price to encourage customers to grab a ride.

Companies in every industry queried are searching for better analytics, fueled by richer data, developed for their unique needs.

As innovative applications like these become more widespread, the scope of analytics used across all industries is expanding rapidly. Roberta Bigliani, associate vice president and head of Europe, Middle East and Africa for IDC Energy Insights, mentions a long list of analytics being used in the global utility industry to understand and manage finance metrics, demand forecasts, energy markets, generation optimization, grid management, outages, operational efficiency and customer service.

Tom Davenport, professor of management and IT at Babson College and author of *Competing on Analytics*, has identified no less than 26 ways retailers are using big data and analytics to improve their operations. The survey indicates that companies in every industry queried are searching for better analytics, fueled by richer data, developed for their unique needs.

NEW KINDS OF DATA

It all starts with data. If data was a mountain range, it would be fair to say it's undergoing a seismic shift. Some 96 percent of executives surveyed have seen an increase in business information in the past two years, especially involving customer information, operations data, and sales and marketing data. Business information is the tidy bits and bytes from customer records, loyalty programs and day-to-day transactions that enterprise information systems were originally designed to handle. Pulling this data together can bring huge returns.

Davenport points to a U.S. financial services company that uses analytics to produce the highest upsell of products per customer in its industry. Many financial services companies have multiple touchpoints with customers — they interact with them by phone, online and in person — and through multiple accounts. Much of this information is uncoordinated and disjointed, so companies don't know how valuable individual customers are. By pulling this information together and applying analytics against it, they can detect subtle patterns that show, for instance, that a customer is about to close an account or would welcome information about other products the company offers.

That's hugely valuable, of course. But even while new and existing types of data swell to historical proportions, they don't begin to tell the full big data story. Companies have begun adding external information to their own data stores, such as weather, traffic, clinical and utility information. From Australia to Mexico, France to Canada, governments are releasing "open data" — new kinds of public information — that provides companies with even more choices for data enrichment.

This tsunami of information from different data sources is making all past generation data piles look small and narrow by comparison. Internet searches, web activities, social media, clickstream and mobile geospatial applications are adding context to data stores at a rate that would have been unimaginable a decade ago.

FASTEST GROWING DATA SOURCES IN THE PAST 2 YEARS

Customer Information	33%
Sales/Marketing	30%
Operations	30%
Market Data	27%
Social Media	24%
Finance	24%
Service/Support	21%
Research & Development	21%
Regulatory Management	17%
Manufacturing/Supply Chain	17%

"The definition of big data is changing to reflect less on the form that the data is in but rather the value or benefit that can be derived from it."

Over the next two years, nearly one-third of executives say they expect to see growth in customer information and sales and marketing. Interestingly, the largest data growth for retail has come from a relatively new source that is harder to tame — social media. Customers who prowl stores with smartphones in hand to check prices and jump online to discuss products with their social circles are not using data simply to find the best deals. Data is fundamentally changing the relationship between retailers, brands and consumers. For example, a British retail store launched an effort to help people with their holiday shopping by making gift recommendations based on their friends' social data.

THE INTERNET OF THINGS

On the horizon, "The Internet of Things" — the era of connected devices — promises to bring another exponential leap in data stores. Devices are connected to embedded software and sensors, from large equipment like aircrafts to small household tools like thermostats. Wearable devices, too, suggest a world where anything — and anyone — can become a data collection center.

These sensors on cars, roads, planes, factory equipment and parcels are providing entirely new ways of understanding all sorts of behaviors and processes. "A connected car could notify a driver if a part on the vehicle is failing, direct him to the nearest dealer with the part in stock and predict how long he'll have to wait," says Steve Jones, global vice president of big data at technology consulting firm Capgemini. "The most loyal customers could be rewarded with a priority pass that could let them jump to the front of the line."

DATA MANAGEMENT CHALLENGES

At the forefront of the changing data landscape is getting open source software frameworks in Hadoop and NoSQL, relational databases and other technologies like Spark to work hand-in-hand. They store and analyze staggering amounts of the new kinds of data from the web, mobile, social and sensors, along with the traditional data from both internal and external sources. Together, these technologies remove the cost and scale barriers that stymied big data in the past, opening the door to new and different kinds of analytics to be applied in one cohesive data pool.

"The definition of big data is changing to reflect less on the form that the data is in but rather the value or benefit that can be derived from it," says Neil Mendelson, vice president of big data and advanced analytics at Oracle. "The challenge that we face today is not to treat the new technologies as an island but to fit them into an existing infrastructure without compromising the enterprise-grade security and availability that the market continues to demand."

PREDICTION: WHERE DATA WILL COME FROM THE NEXT 2 YEARS

External Data Sources	
Social Media	27%
Market Data	25%

Internal Data Sources	
Customer Information	32%
Sales/Marketing	29%
Operations	27%
Finance	21%
Service/Support	21%
Research & Development	20%
Regulatory Management	18%
Manufacturing/Supply Chain	15%

Merely a quarter of executives in the survey believe their organizations are highly effective in achieving the basic purpose of big data: translating information into actionable intelligence.

That's what big data is: a process of taking enormous amounts of data and different types of data, from divergent and inherently mismatched sources, and blending it together. And once it's blended together, companies can dip in and pull out insights in real time to fine-tune marketing campaigns, develop new products, transport goods more efficiently and improve every element of their operations.

The realization of the vital importance of data is matched only by companies' concerns over their ability to handle it. Merely a quarter of executives in the survey believe their organizations are highly effective in achieving the basic purpose of big data: translating information into actionable intelligence.

The three biggest areas of concern for executives are their company's existing systems not being designed to meet their industry's specific requirements; the lack of timely information reaching business managers; and business managers needing to lean too heavily on IT to access, compile and analyze information.

Executives realize that in a world that moves at Internet speed, decision makers have to be able to pull insights out of data themselves rather than wait for IT to run a report for them. Our survey revealed that leaders in the financial sector are most frustrated with their inability to access information directly. But across all industries, they are demanding better data delivered more quickly.

LEAPING INTO ACTION

The big data movement is being driven by the growing recognition of its impact on revenues. Even while they are daunted by big data, leading companies realize they cannot wait: 98 percent of those surveyed are planning investments in technology infrastructure, business intelligence tools, and business and industry applications, and working with external vendors to manage their critical data.

For example, over the next two years, health care companies plan to invest heavily in the crucial plumbing of big data — databases and middleware as well as business intelligence and analytics. These tools will help them improve waiting time in hospitals; assign the right types of professionals to the care teams for individual patients; and help them target treatments more effectively.

INVESTMENT PRIORITIES FOR THE NEXT 2 YEARS

Technology Infrastructure	53%
Business Intelligence Tools/Analytics	48%
Business Applications	44%
Hardware	43%
Industry-Specific Applications	43%
No Plan for Additional Investments	2%

"Big data is changing the way that pharmaceutical companies develop drugs," explains Graham Leask, consultant and researcher in pharmaceutical strategy and return on investment (ROI) analysis at Aston Business School in Birmingham, England. "Previously, the blockbuster model required pharmaceutical companies to develop drugs that could treat conditions like ulcers that afflicted a wide variety of patients with essentially the same symptoms and characters."

"Rather than building capabilities in-house, utilities and other industries should look at cloud technology as a way to procure skills and platforms. In other words, they should think about big data and analytics as a service."

He says that gathering genomic information about individual patients can result in drugs that in theory would treat one patient and one patient only — the new era of personalized medicine. But every aspect of health care could be affected. For example, in the European Union, the Open Data Institute is helping incubate startups that will, among other things, improve drug prescription processes.

These plans indicate that companies realize that they need not only the new generation of analytics, but also a more robust infrastructure to handle the growing amounts of data that are coming their way — and the even larger amounts that will arrive in the future.

Cloud services that complement on-premises capabilities will be crucial to handling the massive demands of big data. "In order to take advantage of the continuous evolution of big data and analytics technologies and capabilities, companies should change the procurement approach," IDC Energy Insights' Bigliani says. "Rather than building capabilities in-house, utilities and other industries should look at cloud technology as a way to procure skills and platforms. In other words, they should think about big data and analytics as a service."

EXPLORING TYPES OF ANALYTICS

As sources of data grow exponentially, so do the *types* of analysis that can be done. New software is emerging that allows business users (rather than just IT specialists) to explore and discover insights in massive Hadoop data stores — the self-service model that financial executives and others in the survey are clamoring for.

The technology community is moving forward with a steady evolution of analytics. The first step was descriptive analytics, which merely described business issues that had taken place. That gave way to predictive analytics, which crunched data to predict future outcomes. For example, if customers knew a rainstorm was coming, which products would they buy? The next stage, Davenport says, is "prescriptive analytics," which tell workers how to do their jobs better, like responding to a customer in a call center in a way that not only solves an issue, but also results in a bigger sale.

Equally important, advances in data visualization are allowing insights to be pulled from mounds of data rapidly. Complex data becomes more accessible, understandable and usable when it's converted from static numbers into charts, timelines and other visual formats.

As analytics mature — fueled by better data — these tools are allowing companies to create more intimate and personal relationships with customers. And as analytics become even more precise, companies want tools that are more individualized for their unique needs.

COMPANIES CRY OUT FOR INDUSTRY SOLUTIONS

Industry	Systems Aren't Designed for Their Industry	Using More Industry-Specific Apps	Plan to Use More Industry-Specific Apps
Retail	48%	56%	46%
Manufacturing	37%	64%	48%
Telecommunications	37%	52%	42%
Utilities	36%	62%	43%
Health Care	35%	45%	40%
Financial Services/ Insurance	31%	56%	39%

"The change is about zeroing in on the individual rather than placing customers into one of 16 buckets of customers who all get the same message."

More than half of all executives surveyed have increased usage of industry-specific applications today compared to usage two years ago. Executives in telecommunications, manufacturing, retail and other industries realize they need new tools and workers with new skills to take advantage of the big data avalanche. And they are sure they *must* take advantage of it.

"Personalization used to be the customer saying he wanted a product in blue rather than another color," says Jones. Now it's about the service provider choosing for the customer, and delighting him with an offer he didn't know he wanted until he saw it. "The change is about zeroing in on the individual rather than placing customers into one of 16 buckets of customers who all get the same message," he says.

CONCLUSION

Managing data and turning it into useful information is a matter of intense interest to executives across all industries. They do not feel their companies are accomplishing this well at the moment, in part due to tools that are not suited to their industries' needs and which take too long to provide helpful guidance.

Plus, they are challenged with an ever-increasing flow of data and influx of different types of data from a variety of sources.

As a result, these companies — that regularly depend on outside vendors and welcome their advice — are investing more money in both internal and external systems. With their desire to resolve these issues, these executives are actively looking to the vendors on whom they rely. This presents an opportunity to offer technology solutions that improve the companies' ability to use their data capital to deliver services to their users and stakeholders.

WSJ. CUSTOM STUDIOS

GAINING THE DIGITAL ADVANTAGE

IN COLLABORATION WITH ORACLE

WSJ. Custom Studios

WSJ. Custom Studios, the content marketing division within The Wall Street Journal's advertising department, crafts stories that engage consumers and elevate the conversation for brands. Its global team of award-winning editors, designers and interactive developers are all held to the high standards for which The Wall Street Journal is known, resulting in highly original and credible content that resonates with the client's target audience.

NEW YORK
1155 Avenue of the Americas
5th Floor
New York, NY 10036

LONDON
The News Building
1 London Bridge Street
London SE1 9GF

HONG KONG
25/F, Central Plaza
18 Harbour Road
Wanchai
Hong Kong

Sarah Dale
Vice President, Media Sales
212.597.5729
sarah.dale@dowjones.com

This work was commissioned by ORACLE

Oracle engineers hardware and software to work together in the cloud and in your data center. For more information about Oracle (NYSE:ORCL), visit oracle.com

Redwood Shores
Oracle Corporation
500 Oracle Parkway
Redwood Shores, CA 94065
Corporate Phone: 650.506.7000

For more information regarding Oracle Big Data, visit: oracle.com/bigdata